REMARKS

The Examiner is thanked for providing a careful review of this application. Claims 1-2, 4-8, 10-12, and 15-21 have been amended. Claims 22-26 have been added. Claims 1-26 are pending after entry of the present Amendment.

Information Disclosure Statement

In accordance with the Examiner's request, a duplicate of the Information Disclosure Statement filed by the Applicant on October 3, 2000, will be sent via Examiner facsimile to 703-746-5850.

Claim Objections

Claim 21 was objected to because of an improper phrase "{entire?partial?}." Claim 21 has been amended to remove the phrase "{entire?partial?}."

Claims 13-17 were objected to as being dependent upon a rejected base claim. The Office has indicated that claims 13-17 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 22 has been added to represent claim 13 rewritten in independent form including all of the limitations of independent claim 12 from which it depends. Claim 23 representing claim 15 has been added to depend from claim 22. Claims 24-25 representing claims 16-17, respectively, have been added to depend from claim 23. According to the Office's statement, claim 22 should be in condition for allowance. In following, claims 23-25 which depend from claim 22 should also be in condition for allowance. Additionally, claim 26 has been added to represent claim 14 rewritten in independent form including all of the

limitations of independent claim 12 from which it depends. According to the Office's statement, claim 26 should be in condition for allowance.

As described below, claim 12 has been amended to be in better consideration for allowance. Therefore, original claims 13-17, which ultimately depend from claim 12, remain pending.

Allowable Subject Matter

The Applicants acknowledge that the Office has determined that claims 6-11 and 21 are allowable.

Rejections under 35 U.S.C. § 102

Claims 1 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Norton et al. ("Norton") (U.S. Patent No.: 5,704,836). These rejections are respectfully traversed.

With respect to claim 1 as amended, Norton does not teach "the input image processor programmed to (a) isolate the human form from the background in the captured video image by comparing the captured video image with a video image of the background without the human form." More specifically, Norton does not teach comparing a video image including a background and a human form with a video image including a background without a human form.

Norton teaches the following, "Upon positioning the subject 28 within the field of view (block 106) and completing the sensitivity adjustment (block 108), the control system 20 reads the subject frame 90 (block 110)." (column 14, lines 21-24) "The frame data 30 is then stored by the command unit 24 (block 112). When the frame data 30 for the initially read frame is stored, the control system 20 reads the subject frame 90 again (block 114)."

(column 14, lines 28-32) "For the sake of discussion herein, the previously read and stored frame will be called the previous frame and the subsequently read frame will be called the present frame. The command unit 24 now compares the present frame to the previous frame (block 116)." (column 14, lines 34-39)

As indicated by the above-referenced teachings, Norton teaches reading a previous and a present frame, wherein both the previous and present frame include the subject or human form. Norton further teaches tracking the edge of the human form in both the previous and present frames to determine the direction and velocity associated with motion of the human form. In contrast to Norton, the presently claimed invention, requires that the human form be isolated from the background by comparing captured video images that contain both the background and the human form with captured video images that contain the background without the human form.

With respect to claim 18 as amended, Norton does not teach "calculating arm position and movement data, wherein the calculating includes calculating angles of principle moment of the arm portions of the human form." More specifically, Norton does not teach calculating angles of principle moment of the arm portions.

Norton teaches the following, "Once the edge of the subject 28 is determined, then the position of the subject 28 in the previous and the present frame provide a base from which the movement may be analyzed. The movement of the subject 28 as read by the command unit 24 is indicated by command vector C, from which velocity and direction are computed (blocks 124 and 126)." (column 15, lines 28-34)

As indicated by the above-referenced teachings, Norton teaches calculating the velocity and direction of movement of the subject. However, Norton does not teach calculating angles of principle moment of the arm portions of the human form as required by the presently claimed invention.

In view of the foregoing, the Applicants respectfully submit that Norton fails to teach each and every element and limitation as required for a 35 U.S.C. 102 rejection. For at least these reasons, it is submitted that independent claims 1 and 18 are patentable over the cited art of record. For at least the same reasons, the Applicants respectfully submit that dependent claim 19 is patentable over the cited art of record. Therefore, the Office is respectfully requested to withdraw the 35 U.S.C. 102 rejections.

Rejections under 35 U.S.C. § 103

Claims 2-3 were rejected under 35 U.S.C. 103(a) as being unpatentable over Norton in view of Freeman (U.S. Patent No: 5,454,043). These rejections are respectfully traversed.

Claims 2-3 depend from claim 1 as amended. For at least the reasons previously stated with regard to the rejections under 35 U.S.C. § 102, the Applicants submit that independent claim 1 as amended is patentable over the cited art of record. For at least the same reasons, the Applicants respectfully submit that dependent claims 2-3 are patentable over the cited art of record.

Claims 4-5, 12, and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Norton in view of Tsutsuguchi et al. ("Tsutsuguchi") (U.S. Patent No: 6,072,494). These rejections are respectfully traversed.

With respect to claims 4-5, 12, and 20, neither Norton, Tsutsuguchi, nor any combination thereof teach or suggest all of the claim limitations. With respect to claim 4, neither Norton, Tsutsuguchi, nor any combination teach or suggest "capturing video images of a background without a human form and a background with a human form and processing those images to isolate the human form from the background." With respect to claim 5, neither Norton, Tsutsuguchi, nor any combination teach or suggest "capturing

video images of a background without a human form and a background with a human form with the device and using the image processor to process those images to isolate the human form from the background." With respect to claim 12, neither Norton, Tsutsuguchi, nor any combination teach or suggest "capturing video images with the device, the video images including an image of a background without a human form and an image of a background with a human form; using the image processor to process those images to isolate the human form from the background." With respect to claim 20, neither Norton, Tsutsuguchi, nor any combination teach or suggest instructions for "capturing video images with the device, the video images including an image of a background without a human form and an image of a background with a human form; using the image processor to process those images to isolate the human form from the background."

As previously discussed with regard to the rejections under 35 U.S.C. § 102, Norton teaches the following, "Upon positioning the subject 28 within the field of view (block 106) and completing the sensitivity adjustment (block 108), the control system 20 reads the subject frame 90 (block 110)." (column 14, lines 21-24) "The frame data 30 is then stored by the command unit 24 (block 112). When the frame data 30 for the initially read frame is stored, the control system 20 reads the subject frame 90 again (block 114)." (column 14, lines 28-32) "For the sake of discussion herein, the previously read and stored frame will be called the previous frame and the subsequently read frame will be called the present frame. The command unit 24 now compares the present frame to the previous frame (block 116)." (column 14, lines 34-39)

As indicated by the above-referenced teachings, Norton teaches reading a previous and a present frame, wherein both the previous and present frame include the subject or human form. Norton further teaches tracking the edge of the human form in both the previous and present frames to determine the direction and velocity associated with motion

of the human form. In contrast to Norton, the presently claimed invention, requires that the human form be isolated from the background by comparing captured video images that contain both the background and the human form with captured video images that contain the background without the human form.

The Office has relied upon Tsutsuguchi for teaching steps for calculating arm position and movement data in the broadest terms. The Office does not rely upon Tsutsuguchi for teaching isolation of a human form from a background. The Applicants respectfully submit that Tsutsuguchi, like Norton, fails to teach a requirement that the human form be isolated from the background by comparing captured video images that contain both the background and the human form with captured video images that contain the background without the human form. Therefore, neither Tsutsuguchi, Norton, nor any combination thereof teach or suggest isolating a human form from a background by comparing an image containing both the background and the human form to an image containing the background without the human form.

In summary, to establish a *prima facie* case of obviousness, the references when combined must teach or suggest all the claim limitations. Therefore, it is respectfully submitted that the Office has not established a *prima facie* case of obviousness because the references when combined do not teach or suggest all of the claim limitations. For at least these reasons, the Applicants respectfully request that the rejection of independent claims 4-5, 12, and 20, be withdrawn. For at least the same reasons, the Applicants respectfully submit that dependent claims 13-17 are patentable over the cited art of record.

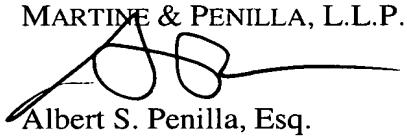
Additional Claim Amendments

In addition to the amendments made to claims 1, 4, 5, 12, 18, and 20 on matters of substance, various other amendments have been made to claims 1-2, 4-8, 10-12, and 15-21

to ensure clarity and proper use of antecedent basis. These various other amendments do not affect the meaning or scope of the claims as previously worded.

The Applicants respectfully submit that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested. If the Examiner has any questions concerning the present amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6900 ext. 6903. If any additional fees are due in connection with filing this amendment, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. SONYP003). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
MARTINE & PENILLA, L.L.P.



Albert S. Penilla, Esq.
Reg. No. 39,487

Martine & Penilla, LLP
710 Lakeway Drive, Suite 170
Sunnyvale, California 94086
Tel: (408) 749-6900
Customer Number 25,920

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Docket No: SONYP003
Marks, Richard	
Application No: 09/654,141	Group Art Unit: 2674
Filed: September 1, 2000	Examiner: Nguyen, Francis N.
For: USER INPUT DEVICE AND METHOD FOR INTERACTION WITH GRAPHIC IMAGES	Date: February 26, 2003

MARKED UP AMENDMENT

MARKED UP CLAIMS

1. (Amended) An input device for providing a signal to effect one of translational movement, rotational movement, and both translational [and/or] and rotational movements of an object on a graphical display, comprising:

a device for capturing video images;

an input image processor that translates captured video images of human arm motion into signals that are delivered to an output image processor, the input image processor programmed to (a) isolate [the] a human form from [the] a background in [the] a captured video image by comparing the captured video image with a video image of the background without the human form; (b) determine [the] a position and a movement of arms of the human form [arms]; and (c) generate an output signal responsive to one of the position, the movement, and both the position [and/or] and the movement of the human arms; and

an output image processor that is programmed to effect one of translational movement, rotational movement, and both translational [and/or] and rotational movement of an object on a graphical display in response to the signals received from the input image processor.

2. (Amended) The input device of claim 1 wherein the output image processor changes the graphical display according to [the] a perspective of what a flying object would see.

4. (Amended) A method for generating signals to effect one of translational movement, rotational movement, and both translational [and/or] and rotational movements of an object on a graphical display using human arm position and movement data, comprising:

providing an image processor and a device for capturing video images;

capturing video images of a background without a human form and a background with a human form; [and]

processing [those] the captured video images to isolate [a]the human form from [a]the background;

isolating [the] arm portions of the human form;

calculating [the] arm position and movement data; and

generating a signal responsive to the arm position and movement data for effecting one of translational movement, rotational movement, and both translational [and/or] and rotational [movement] movements of an object on a graphical display.

5. (Amended) A method for generating signals using one of human arm position data, human arm movement data, and both human arm position [and/or] and movement data, comprising:

providing an image processor and a device for capturing video images;

capturing video images of a background without a human form and a background with a human form with the device; [and]

using the image processor to process [those] the captured video images to isolate [a]the human form from [a]the background;

isolating [the] arm portions of the human form from a captured video image using the image processor;

calculating [the] arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor.

6. (Amended) A method for generating signals to effect one of translational movement, rotational movement, and both translational [and/or] and rotational movements of an object on a graphical display using one of human arm position data, human arm movement data, and both human arm position [and/or] and movement data, comprising:

providing an image processor and a device for capturing a video sequence;

capturing, from the video sequence, a frame that does not include a person;

isolating a view comprising a foreground subject image view by performing an algorithm on the video sequence and the frame that does not include the person;

determining whether the isolated view includes [the] an image of a person;

determining [the] a horizontal extent of [the subject's] a torso in the image of the person so as to isolate [the] arm portions of the [human form] person in [each] frames of the captured video [frame] sequence;

computing [the] arm angles by calculating angles of principle moment of [the] nonzero pixels in the arm portions of the [video] image of the person; and

generating an arm position data signal responsive to arm angles for effecting one of translational movement, rotational movement, and both [the] translational [and/or] and rotational movement of an object on a graphical display.

7. (Amended) The method of claim 6 wherein the step of determining whether the isolated view includes the image of the [a] person comprises the steps of:

counting [the] a total number of nonzero pixels in the foreground image;

ensuring that the total number of nonzero pixels in the foreground image falls within a range defined by a minimum and a maximum threshold number of pixels.

8. (Amended) The method of claim 6 wherein the algorithm in the isolating step involves subtracting the frame that does not include [a] the person from [the] individual frames in the video sequence.

10. (Amended) The method of claim 6 wherein the arm [position/movement] position data [signals] signal generated in the generating step [are] is selected from the group consisting of signals related to object airspeed acceleration, bank angle, and pitch angle.

11. (Amended) The method of claims 6 wherein the arm [position/movement] position data [signals] signal generated in the generating step [are] is determined with the inclusion of smoothing constants.

12. (Amended) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational [and/or] and rotational movement, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device, the video images including an image of a background without a human form and an image of a background with a human form; [and]

using the image processor to process [those] the captured video images to isolate [a]the human form from [a]the background;

isolating [the] arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor for use in generating [the] a state of a flight simulator graphical display.

15. (Amended) The method of claim 13 further including [the] a step of generating flapping noises corresponding to [the] movement of the wings of the flying creature.

16. (Amended) The method of claim 15 wherein [the] a volume of the flapping noises increases with an increased rate of [captured] arm motion.

17. (Amended) The method of claims 15 wherein the flapping [noise is] noises are triggered when [the] a signed time rate of change of [the] an average of [the] arm angles exceeds a pre-determined threshold.

18. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing video images; [and]

processing [those] the captured video images to isolate a human form from a background;

isolating [the] arm portions of the human form;

calculating [the] arm position and movement data, wherein the calculating includes calculating angles of principle moment of the arm portions of the human form; and

generating a signal responsive to the arm position and movement data for effecting one of translational movement, rotational movement, and both translational [and/or] and rotational movement of an object on a graphical display.

19. (Amended) The article of manufacture of claim 18 wherein the signal generated by the program of instructions is used to generate [the] a state of a flight simulator graphical display.

20. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing video images with [the] a device, the video images including an image of a background without a human form and an image of a background with a human form; [and]

using [the] an image processor to process [those] the captured video images to isolate [a]the human form from [a]the background;

isolating [the] arm portions of the human form from a captured video image using the image processor;

calculating [the] arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor.

21. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing, from [the] a video sequence, a frame that does not include a person;

isolating a view [(foreground/subject image)] of an image of the person by performing an algorithm on the video sequence and the frame that does not include [a] the person; [{entire? partial?}]

determining whether the isolated view includes the image of [a] the person;

determining [the] a horizontal extent of [the subject's] a torso of the person in the image so as to isolate [the] arm portions of the [human form in a/the/each captured video frame] person in the image;

computing [the] arm angles by calculating angles of principle moment of [the] nonzero pixels in the arm portions of the [video] person in the image; and

generating one of an arm position data signal, an arm movement data signal, and both [an arm position/movement] arm position and movement data [signal] signals

responsive to the computed arm angles for effecting one of translational movement, rotational movement, and both [the] translational [and/or] and rotational movement of an object on a graphical display.

22. (New) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational and rotational movement, wherein the flight simulator graphical display includes as an object a flying creature that moves wings, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device;

using the image processor to process the captured video images to isolate a human form from a background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor, the signal to be used in generating a state of the flight simulator graphical display.

23. (New) The method of claim 22 further including a step of generating flapping noises corresponding to a movement of the wings of the flying creature.

24. (New) The method of claim 23 wherein a volume of the flapping noises increases with an increased rate of arm motion.

25. (New) The method of claim 23 wherein the flapping noises are triggered when a signed time rate of change of an average of calculated arm angles exceeds a pre-determined threshold.

26. (New) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational and rotational movement, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device;

using the image processor to process the captured video images to isolate a human form from a background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor, the signal to be used in generating a state of the flight simulator graphical display, wherein the flight simulator graphical display depicts a change in perspective of what a flying creature would see.